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On the Systematic Position of Some Amer- ican Species of *Philoscia* Latreille (Isopoda, Oniscoidea)¹

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Knowledge of the American land isopods has been considered by some authors to be still in a backward state. Two very useful and convenient monographic works on the American land isopods, Richardson's "Monograph on the isopods of North America" (1905) and Van Name's "The American land and fresh-water isopod Crustacea" (1936, with supplements in 1940 and 1942), seem to contradict the first statement. However, these monographs contain many transcriptions of brief original descriptions and of inadequate figures. There seems to have been no attempt by these authors to discuss the correct systematic position of most of the species. Thus, the study of these animals in America is somewhat difficult.

The oniscids, the group with the largest number of American species, show the greatest difficulties. Most of the species of this family have been placed in the genus *Philoscia* Latreille, *sensu lato*, a procedure adopted by Van Name in his monograph. However, the genus *Philoscia* Latreille has been subdivided into new genera of narrower scope, subgenera, and sections. According to Verhoeff, it is even doubtful or improbable that the true *Philoscia*, in its actual restricted sense, occurs in

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America, because the genus so understood comprises only a few European species. Thus there is in America a large number of very different species grouped together into what we could call the "*Philoscia* complex." A careful study of these species is necessary in order that they may be placed in their correct systematic position.

In the present paper, to supplement the descriptions of three American species of *Philoscia*, I give notes based on specimens in the collections of the American Museum of Natural History and of the United States National Museum. The three species are placed in the genera in which they apparently belong.

The author wishes to express his sincere thanks for much helpful assistance during the course of the investigation to Dr. Dorothy E. Bliss, Assistant Curator of Invertebrates, to Dr. Libbie H. Hyman, Research Associate in Invertebrates, both of the Department of Fishes and Aquatic Biology of the American Museum of Natural History, and to Dr. A. Vandel, of the Faculté des Sciences de Toulouse, France.

FAMILY ONISCIDAE

Alloniscus culebrae (Moore)

Figures 1-6

Philoscia culebrae MOORE, 1901, p. 176, pl. 11, figs. 13-17. RICHARDSON, 1905, p. 604, fig. 660. VAN NAME, 1924, p. 194; 1936, p. 168, figs. 86, 87.

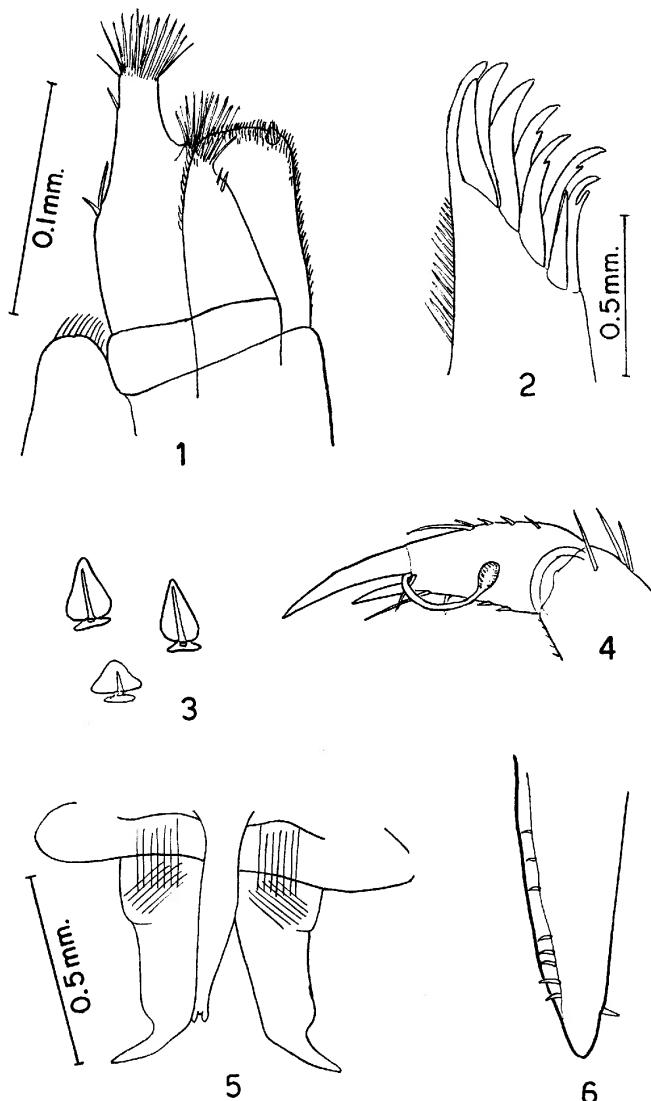
Halophiloscia culebrae, VANDEL, 1945, p. 242; 1949, p. 8. ARCANGELI, 1948, p. 482.

Not *Philoscia culebrae*, Pearse, 1915, p. 534, fig. B.

This species, as were others from America which inhabit the sea coasts, has been placed in the genus *Halophiloscia* Verhoeff. Van Name (1936) was the first to regard *Philoscia culebrae* as probably belonging to the "*Halophiloscia* group." He likewise considered as members of this group *P. culebroides* Van Name, *P. richardsonae* Holmes and Gay, *P. nomae* Van Name, *P. bermudensis* Dahl, and *Halophiloscia brasiliensis* Moreira. Vandel (1945 and 1949) and Arcangeli (1948) have included these species in the genus *Halophiloscia* Verhoeff, and the first-cited author lists one more species, *Philoscia bonariensis* Giambiagi de Calabrese, as a probable member of the genus.

However, the existence of species that actually belong to the genus *Halophiloscia* in America has not yet been conclusively demonstrated, because the descriptions of all American species included in it are very incomplete and lack important details, such as the aspect of the genital appendage and of the first male pleopods.

I have examined the specimens of *Philoscia culebrae* Moore in the



FIGS. 1-6. *Alloniscus culebrae* (Moore). 1. Maxilliped. 2. First maxilla. 3. Scale setae. 4. Dactylus of the first pereiopod, showing the "dactylian organ." 5. Endopodites of the first male pleopods and genital appendage. 6. Extremity of the endopodite of the first male pleopods.

Figures with similar magnification: 1, 4; 2, 6.

collections of the American Museum of Natural History and the United States National Museum (where the types are deposited), and I have verified the fact that they belong to the genus *Alloniscus* Dana. In the United States National Museum there are three different species of *Alloniscus* labeled as *Philoscia culebrae*: *culebrae* proper (only the specimens from Puerto Rico), *compar* Budde-Lund (specimens from Florida), and a third species now in course of study. Specimens labeled as *Philoscia vittata* Say also belong to this third mentioned species.

As a supplement to the earlier descriptions of *Alloniscus culebrae*, the following notes are given:

The surface of the body is covered with wide and short scale setae, composed of a single central axis and supported by a basal scale; these scale setae are inserted on small tubercles.

The dactylus of the pereiopods has a "dactylian organ" composed of a long and slender peduncle and an oval and ciliate distal dilatation.

The first maxillae have nine visible teeth on the outer lobe. Of the four external teeth the second tooth is slightly shorter than the other three, which are about equal in length; of the teeth of the inner group, four are profoundly incised, especially the last, and one is small and simple.

The palp of the maxilliped has two lobes provided with dense setae and one with only two setae. The endite is rectangular in shape, without teeth and with a small penicillum.

The endopodites of the second male pereiopods are slightly longer than the exopodites.

Alloniscus culebrae seems closely allied to *A. compar*. Perhaps to rank *A. culebrae* as a subspecies of *A. compar* would be advisable. The external aspect of both is very similar, and only the endopodites of the first male pleopods show small but constant differences. In *A. culebrae* the endopodites are wide and with the sides parallel, narrowing abruptly before the extremity, and their apices are provided with a small tooth on the supero-external margin, and with about eight teeth on the infero-internal margin. In *A. compar* the endopodites narrow gradually towards the extremity, and the apices have a tooth-like expansion ornamented with a small spine on the supero-external margin and about eight teeth on the infero-internal margin.

It seems probable that *P. culebroides* also belongs to the genus *Alloniscus*, because it is closely related to *A. culebrae*. *Halophiloscia brasiliensis* Moreira is certainly not a true *Halophiloscia* and probably belongs to the genus *Benthana*. The question of the correct systematic position of the other supposed species of *Halophiloscia* can be settled only when well-preserved male specimens are available for study.

Phalloniscus avrilensis (Van Name)

Figures 7-11

Philoscia avrilensis VAN NAME, 1940, p. 114, figs. 5, 6.*Phalloniscus avrilensis*, VANDEL, 1952, p. 136.

This species was described by Van Name on one male specimen from Bois d'Avril, Haiti, and has been placed in the genus *Phalloniscus* Budde-Lund by Vandel, who considered it very closely related to *P. marcuzae* Vandel and *P. persimilis* Vandel from Venezuela. However, *P. avrilensis* is quite different from any other species of *Phalloniscus*, owing to the largely expanded epimera turned horizontally outward on the three first thoracic segments and also because the head is deeply set back in the thorax. The head has prominent lateral lobes, which give it a superficial likeness to a member of the genus *Oniscus*. In some particulars this species seems more closely allied to *P. kenepurensis* Chilton from New Zealand than to the two species from Venezuela.

I have had the opportunity of examining the type of this species and the following additional notes are given:

The scale setae of the dorsal body surface are not so conspicuous as in the other species of *Phalloniscus*. They are of the tricuspid type, with the greatest width being approximately equal to the length; the central axis is wide and rounded apically.

The telson is not so acute as described and figured; its extremity is, on the contrary, somewhat rounded.

The outer lobe of the first maxillae has nine teeth, all conical and simple.

The inner lobe of the second maxillae is distinctly smaller than the outer.

The endite of the maxilliped bears a large spine anteriorly and two short teeth placed one in front of the other on the inner lateral margin. The palp has two tufts of setae on the penultimate joint, the distal tuft with seven setae and the proximal tuft with two.

The endopodites of the first male pleopods are stout, turned slightly outward at the tip; outer margin towards apex with two teeth separated by a profound concavity.

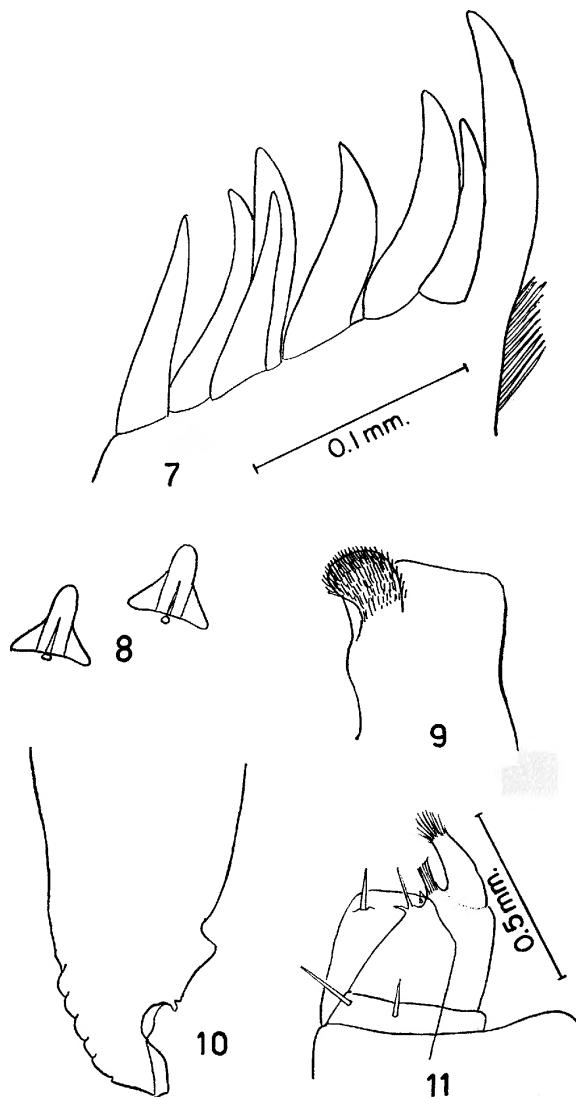
FAMILY PORCELLIONIDAE

Balloniscus paraguayanus (Van Name)

Figures 12-19

Philoscia paraguayana VAN NAME, 1936, p. 139, fig. 66.

The genus *Balloniscus* was established by Budde-Lund (1908) without a diagnosis but with the statement that its species are characterized by having well-developed tracheae in the pleopods. This genus in-



Figs. 7-11. *Phalloniscus avriliensis* (Van Name). 7. First maxilla. 8. Scale setae. 9. Second maxilla. 10. Extremity of the endopodite of the first male pleopods. 11. Maxilliped.

Figures with similar magnification: 7, 10; 9, 11.

cluded *Philoscia sellowii* Brandt, *P. brevicornis* Budde-Lund, *P. nigricans* Budde-Lund, and *P. maculata* Budde-Lund.

Despite the presence of tracheae, this genus was placed by earlier authors in the family Oniscidae near *Philoscia* Latreille, *sensu lato*, with which it was frequently confused.

The descriptions of the species referred to this genus were very incomplete, and until a few years ago the genus was insufficiently known. Verhoeff (1951) described a new species, *B. tracheofer* (probably, according Vandel, a synonym of *B. sellowii*), giving the chief characters of the genus. Vandel (1952) described another new species, *B. insularum infra ventum*, showing the aspect of the tracheae which he said was very similar to that of the genus *Protracheoniscus* Verhoeff.

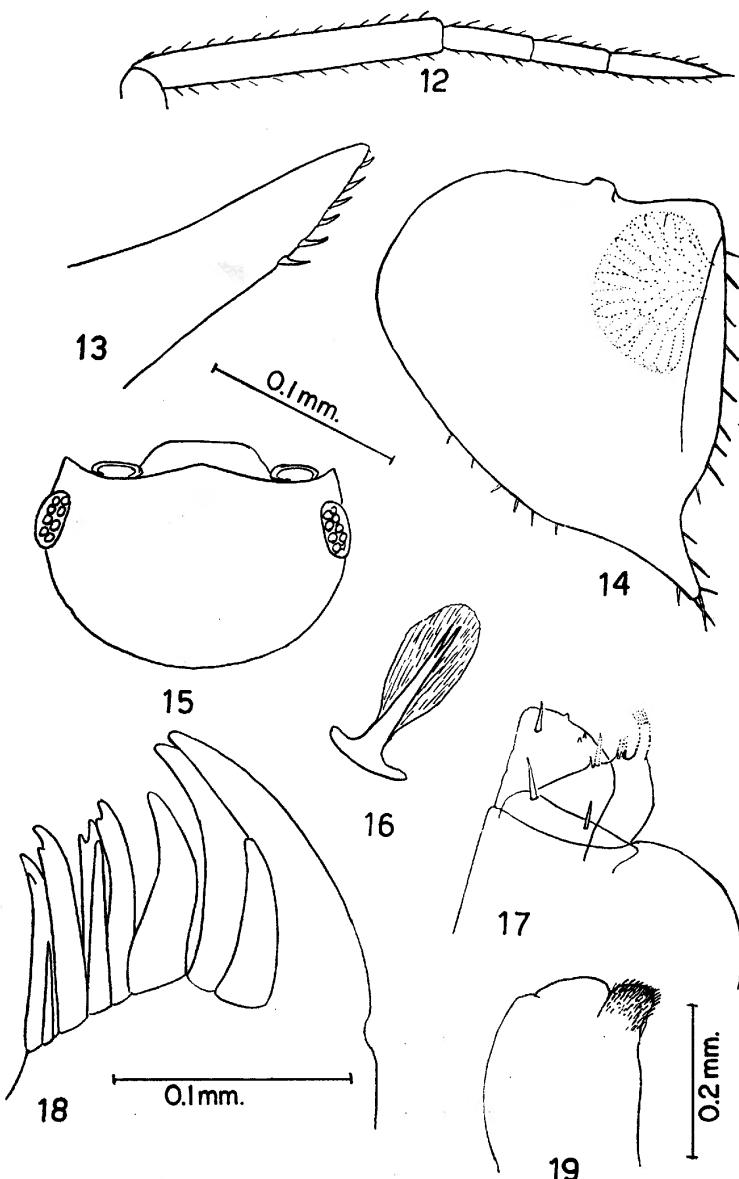
Although Van Name in his monograph considered *Balloniscus* as a subgenus of *Philoscia*, he pointed out the inconvenience of placing this genus among the oniscids: "According to recent views on the importance of tracheae in the exopodites of the pleopoda this should have recognition as a group of at least generic rank, and possibly should be removed to a position nearer to *Porcellio*."

Vandel (1952) removed *Balloniscus* to the "family Porcellionidae, subfamily Porcellionidae Quinquetracheatae" because *Balloniscus* has tracheae in all five pairs of pleopods, although it has three joints on the antennal flagellum. Arcangeli (1954) rejected this approach, stating that all members of the Porcellionidae have only two joints on the antennal flagellum. But this evolutionary concept of Vandel seems much better than the classic distinction between Oniscidae and Porcellionidae based on the number of joints of the antennal flagellum.

An examination of the type specimens showed that *Philoscia paraguayana* Van Name is a typical member of the genus *Balloniscus*. *Philoscia argentina*, described by Giambiagi de Calabrese (1939) and considered by him as closely related to *B. paraguayanus*, is undoubtedly a species of *Balloniscus*. Although Giambiagi de Calabrese did not mention the existence of trachea in the pleopods (probably lack of observation), the other statements and the illustrations lead to such a conclusion.

Other American species of *Philoscia*, *sensu lato*, may belong to this genus, as, for example, *P. paulensis* Moreira from Brazil, but the lack of fresh specimens makes it impossible to settle this question at present.

The growing number of described South American species of *Balloniscus* favours Vandel's view of the South American origin of the genus.



Figs. 12-19. *Balloniscus paraguayanus* (Van Name). 12. Antenna. 13. Extremity of the endopodite of the first male pleopods. 14. Exopodite of the first male pleopods. 15. Head from above. 16. Scale setae. 17. Maxilliped. 18. First maxilla. 19. Second maxilla.

Figures with similar magnification: 12, 13, 14, 18; 17, 19.

Additional remarks concerning Van Name's description of *B. paraguayanus* are:

The dorsal body surface is covered with oval scale setae.

The outer lobe of the first maxillae is composed of 10 teeth; four of the inner teeth are bifid and two are slender and simple.

The second maxillae with the outer lobe much broader than the inner lobe, and without visible setae; apical margin rounded. The inner lobe covered with groups of fine setae.

The endite of the maxillipeds with the upper margin directed obliquely down and outward, with one spine and two small teeth on the anterior aspect and another tooth on the upper margin.

The exopodites of the five pairs of pleopods have branching tracheae.

The exopodites of the first male pleopods triangular in shape, with the outer margin almost straight and distinctly cleft towards the distal apex; endopodites stout, with distal extremities turned somewhat outward and bearing six small teeth.

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